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## **DIVISION 9 SIGNING**

### **SECTION 900 GENERAL REQUIREMENTS FOR SIGNING**

Move any existing street signs, markers, and route markers out of the construction limits of the project and install the street signs and markers and route markers so that they will be visible to the traveling public, if there is sufficient right of way for these signs and markers outside of the construction limits.

Near the completion of the project and when so directed by the Engineer, move the signs and markers and install them in their proper location in regard to the finished pavement of the project.

Stockpile any signs or markers that cannot be relocated due to lack of right of way, or any signs and markers that will no longer be applicable after the construction of the project, at locations directed by the Engineer for removal by others.

The Contractor will be responsible to the owners for any damage to any street signs and markers or route markers during the above described operations.

No direct payment will be made for relocating, reinstalling, and/or stockpiling the street signs and markers and route markers as such work will be considered incidental to other work being paid for by the various items in the contract.

#### **900-2 ACCEPTANCE OF SIGNS**

The contractor may request early acceptance of signs when certain conditions are met. The materials and work eligible for acceptance include the sign panels, sign sheeting and the hardware that is a part of the sign panel. This early acceptance will only be done when:

- A. It is in the best interest of the Department.
- B. The signs are required for traffic control at a particular phase of project construction.
- C. The acceptance will be limited to the aluminum sign panels, retro-reflective sheeting, and associated hardware.
- D. Early acceptance will not be made on sections of new location that are not open to traffic.
- E. This acceptance will not include supports of any kind.

If accepted by the Department, the contractor will be relieved of the responsibility for any damage and/or theft that may occur. However, repair of any damage caused by the contractor or any subcontractor working on the project will be the contractor's responsibility.

For all ground mounted and overhead signs, contact Materials and Tests personnel for a sign final inspection. It is preferable to have the contractor, Engineer and Technician together at the Materials & Tests sign final inspection.

#### **900-4 COVERING OF SIGNS**

**Cover signs in accordance with the manufacturer's recommendations.** The covering must be opaque both day and night. The best option is to not erect a sign that must be covered. Materials such as silt fence fabric, scrap signs, plastic, plywood, and duct tape should never come in contact with the sign face.

## **SECTION 901 SIGN FABRICATION**

### **901-3 CONSTRUCTION METHODS**

#### **(A) GENERAL**

Do not begin fabrication for Type A, B, and C signs until S-dimensions verification revisions have been approved. The forms for verifying S-dimensions may be obtained from the Signing Unit at the following website:

<http://www.ncdot.org/doh/preconstruct/traffic/congestion/Sign/field.html>

Use Internet Explorer to access this website.

When verifying S-dimensions, use the as-built final grade and the as-built typical section to confirm adequate overhead clearance and lateral distance from the edge of the pavement.

In order to prevent sign structure fabrication delays, it is acceptable to confirm S-dimensions based on the original typical sections at the sign locations, but it is imperative that the contractor builds to match the plans.

If a sign is to be placed on an existing structure, the Engineer must verify the structure is adequate early in the life of the project.

Type E & F signs should be placed behind guardrail whenever possible. The location of Type E & F signs can be altered up to 100 feet. On a freeway the minimum distance between a guide sign and a Type E or F sign is 500 feet. On an expressway or other facility the minimum distance between a guide sign and a Type E or F sign is 150 feet.

#### **(B) DEPARTMENT AND CONTRACTOR FURNISHED SIGNS**

After contract award, the contractor shall notify the Engineer in writing of the date he requires any Department furnished signs to be made available. This notification should be made in writing a minimum of four months prior to the date the contractor desires the Department furnished signs. The Engineer shall notify the Signing Section as soon as the contractor has given this notification.

As soon as the contractor advises the Department of the date(s) the signs will be needed the Engineer should develop a method to remind all parties involved that these signs need to be ordered at the appropriate time.

Prior to placing the sign order, the Engineer should verify the sign legend and spelling to ensure that it fits the field conditions.

The Department of Corrections has implemented a prorated pay scale, which provides the Department an economic benefit for ensuring that signs are ordered in accordance with the specified four months. This prorated scale allows the Department to purchase these signs from the Department of Corrections at up to a 20% cost savings over those ordered with less advance notice. Therefore, it is important for these signs to be ordered in a reasonable time frame.

After notification that the requested signs are available, the contractor shall have a maximum of 60 calendar days to pick up the Department furnished signs.

## **-(K) PACKAGING, SHIPPING, AND STORAGE**

Signs stored in the field should be stored in accordance with the sign sheeting manufacturer's recommendations. Signs should never be covered with plastic or canvas which can cause a "greenhouse effect," damaging the sheeting. They should also be placed in a weather-tight, not airtight, building or trailer so that packages and crates will not get wet. If packages should get wet, it is imperative that sign panels be removed immediately and dried off to avoid wrinkling and discoloration of screened message areas on all reflective sheeting signs.

Flat signs should be stored on edge in their original shipping cartons standing at a seventy-five to ninety degree angle. Do not lay flat.

Do not store flat signs outside with the packing on the face. Prolonged contact with moisture will damage all reflective sheeting. This can adversely affect reflectivity and screened colors. The top film may collect moisture and expand resulting in wrinkles that can be permanent.

Many contractors have questioned why a sign cannot become wet in storage when it gets wet after installation. The difference is that the amount of moisture that comes in contact with a sign surface due to rain or dew is normal and tends to run off or evaporate due to air circulation. Avoid trapping moisture against reflectorized sign surfaces.

It is also recommended that the slipsheeting not be removed from the face of the sign until the time of installation in order to avoid possible "screened message transfer." **Do not** ship flat signs unsupported in open containers. These signs are subject to scuffing and abrasion due to load shifting. Signs shipped in an open container are also subject to trapped moisture left on the sign surface overnight when all of the signs are not erected during a single working day.

## **901-4 SIGN QUALITY**

### **(A) GENERAL**

For maximum reflectivity, performance, and acceptability, signs should be kept clean and free from dirt, road tar, oil, asphalt material, and mulch. Since soiling can inadvertently occur on the construction site, it is sometimes necessary for a contractor to perform minor cleaning of reflectorized sign surfaces. Ensure an approved product is used when cleaning signs.

**Before using, the contractor should determine the suitability of the procedure, and the contractor assumes all risks and liability in connection with sign cleaning.**

Each sign should have the appropriate validation sticker on the back of the sign. Wash all signs prior to the final inspection. When cleaning signs, use a cleaning product that has been approved for use by the sheeting manufacturer.

#### **Normal Cleaning Procedure:**

1. Flush the surface with clean water to remove loose dirt particles. A squeeze (or triggered) hose nozzle is convenient for this purpose.
2. Wash the sign face with a soft brush, rag or sponge, using detergent or any of several suitable commercial cleaners. In all cleaning operations, care should be taken not to abrade the sign by the use of stiff-bristle brushes or by unnecessary scrubbing. Some types of car-wash brushes have built-in dispensers for liquid detergents. Wash thoroughly from the top down. Once suds have been applied, keep a steady stream of water flowing on the sign face to wash away dirt particles.
3. Rinse the entire sign face with clean water. Allow to drain dry.



## **SECTION 902 FOUNDATIONS FOR GROUND MOUNTED SIGNS**

Refer to the Signing Project special Provisions of the contract for details of construction for overhead sign foundations. The Contractor is required to perform a boring log at each overhead sign foundation location. This investigation should be performed after rough grade is achieved (within three (3) feet or one (1) meter of final grade).

The Project Special Provisions specify how both spread footing type foundations and drilled pier type foundations are to be constructed. Requirements for excavations, reinforcing steel, and concrete placement are detailed in the Project Special Provisions.

## **SECTION 903 GROUND MOUNTED SIGN SUPPORTS**

### **903-3 CONSTRUCTION METHODS**

#### **(A) LOCATION AND FIELD VERIFICATION**

A policy for verification of S- Dimensions is found in the Engineering Control Section of this manual. Final support designs can only be done after the field verification is complete. The Contractor cannot begin fabrication for Type A and B signs mounted on overhead structures or steel supports until S- Dimensions have been field verified.

When verifying supports, the lateral offset of the supports can be determined from Roadway Standard Drawing 901.70, sheet 2 of 2.

#### **(C) BREAKAWAY STEEL BEAM AND SIMPLE STEEL BEAM**

Ensure that the stub height and other breakaway features conform to the *AASHTO Roadside Design Guide* requirements for crashworthy sign hardware.

#### **(D) STEEL U-CHANNEL POST**

Zinc-rich paint shall meet the requirements of Sections 1080-9 and shall be thoroughly mixed prior to application.

Zinc-rich paint used for touch-up of galvanized products can be obtained from several manufacturers. All paint that will meet the Specifications is furnished in regular paint cans. Currently, **no paint** furnished in aerosol cans will meet NCDOT Specifications. Labels on aerosol cans are often deceptive in that they state the paint will meet performance requirements of said Specifications. In actuality, aerosol cans contain so much solvent that they will not meet the Specification requirement for weight per gallon. **No splicing of u-channel posts is allowed.**

## **OVERHEAD SIGN ASSEMBLIES**

**Refer to the Signing Special** Provisions of the contract for details of construction for overhead sign assemblies.

The Contractor is required to submit detailed working drawings and design computations for each overhead sign assembly to the engineer for approval **prior to fabrication**. Working drawings include complete design and fabrication details, including foundations.

Refer to the appendix for “Anchor Rod Nut Tightening Requirements for Metal Poles” in Division 17 (Signals and ITS) of this manual, when attaching overhead sign assemblies to concrete foundations.

### **SECTION 904 SIGN ERECTION**

#### **904-3 CONSTRUCTION METHODS**

##### **(B) TYPE A, B, & C**

###### **GENERAL**

**When handling signs, care should be taken to ensure that studs are not broken off of the individual sign panels.**

##### **(C) TYPE D, E, AND F AND MILEMARKERS**

When tightening, hold bolts securely and turn the nut to ensure the sign sheeting is not damaged. Always use nylon washers and domestic fasteners.

### **TECHNICIAN'S CHECKLIST SECTION 900 SIGNING**

- 1) Field verify S-dimensions.
- 2) Verify the sign legend and spelling to ensure that it fits the field conditions.
- 3) Check lateral and vertical clearance of sign structures.
- 4) Ensure the contractor requests signs a minimum of 4 months in advance of need.
- 5) Contact Materials and Test Unit for sign inspection.
- 6) Ensure that clearing for sign sight distance is complete.
- 7) Wash all signs prior to the final inspection.
- 8) Contact Materials and Test Unit for final sign inspection.
- 9) Ensure that clearing provides proper sign distance for all signs.

## **PROCEDURES FOR PAYING SIGN INVOICES IN SAP**

- All sign invoices are paid in SAP.
- Type MIGO in the transaction window (Goods Receipt – Purchase order).
- Type in Purchase Order Number.
- Click corresponding line item OK.
- Save (write down goods receipt number on invoice).
- Type MIRO in the transaction window.
- Type in invoice date.
- Type in invoice number under reference number.
- Amount of invoice.
- Date received invoice.
- Type in purchase order number
- Hit enter.
- Verify that line items from Purchase Order are all highlighted.
- Save.
- Write down document number on invoice.
- At this point you must scan the invoice into SAP under the document number from the MIRO transaction.
- Go to OAWD.
- Click FI/CO Document type.
- Click P.O. invoice scanned.